

Mumbai University

Question Paper

**[CBSGS – 75:25 PATTERN]
(OCTOBER – 2015)**

PAPER - IV

ELECTIVE

**GEOGRAPHIC
INFORMATION
SYSTEM**

Time: 2 $\frac{1}{2}$ Hours

Total Marks: 75

N.B.: (1) All Questions are Compulsory.
 (2) Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.
 (3) Answer To The Same Question Must Be Written Together.
 (4) Number To The Right Indicates Marks.
 (5) Draw Neat Labeled Diagrams Wherever Necessary.
 (6) Use of Non – Programmable Calculator is allowed.

Q.1 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) Convert the following into degrees: (5)

(i) $45^{\circ} 15' 45''$
 (ii) 1745 rad

(B) Draw the line coverage using the following data structure: (5)

Arc-Node List			Arc-Coordinate List	
Arc	F-node	T-node	Arc	Coordinates list
1	11	12	1	(0, 9) (3, 9)
2	12	13	2	(3, 9) (9, 9)
3	12	14	3	(3, 9) (3, 6) (2, 4) (3, 2)
4	13	15	4	(9, 9) (7, 5)
5	13	16	5	(9, 9) (8, 1)
6	15	16	6	(7, 5) (5, 3) (8, 1)
7	16	14	7	(8, 1) (5, 1) (3, 2)

(C) Explain with suitable example cell-by-cell Encoding Raster Data Structure. (5)

(D) What is rasterization? Write the steps for it. (5)

Q.2 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) List various data sources that can be used to create new geospatial data. Explain any one. (5)

(B) Explain the terms: (5)

(i) COGO
 (ii) Geometric Transformation

(C) Write the four types of Transformation Methods. Also show their effects on a Rectangular Object. (5)

(D) Explain the bilinear interpolation resampling method with suitable example. (5)

Q.3 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) Explain file and Hierarchical Database with suitable example. (5)

(B) Explain the following with respect to color: (5)

(i) Hue
 (ii) Value
 (iii) Chroma

(C) Describe Choropleth Map and Chart Map with neat diagrams. (5)

(D) What is visual hierarchy in map design? How is the hierarchy related to the map purpose? (5)

[TURN OVER]

Q.4 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) What is Descriptive Statistics? Explain. (5)
 (B) Write a note on Spatial Data Query. (5)
 (C) How Map Comparison can be used for Data Exploration? (5)
 (D) What is the output of the following for a statement (slope = 3) AND (Aspect = 2) (5)

Aspect							Slope						
3	2	1	1	1	2	2	2	2	1	1	1	2	
2	3	3	3	3	3	1	1	1	2	2	1	1	
1	2	3	2	1	1	1	3	1	2	3	3	2	
2	2	3	1	1	1	2	2	2	2	3	1	1	
2	2	2	1	1	1	1	1	1	2	2	2	2	
3	2	2	1	2	1	2	3	3	1	2	1	1	
3	2	3	3	3	2	2	3	2	1	2	2	3	
2	2	2	1	3	1	3	3	1	1	2	3	3	

Q.5 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) Explain the Density Estimation Local Method. (5)
 (B) Explain Slivers from Overlay Operation. (5)
 (C) What are Thiessen Polygons? Give an example. (5)
 (D) Define the following:
 (i) Nugget
 (ii) Range
 (iii) Sill
 (iv) Partial Sill
 (v) Anisotropy

Q.6 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) Describe how the semivariance can be used to quantify the spatial dependence in a dataset. (5)
 (B) The root mean square (RMS) Statistics is commonly used for selecting an optional interpolation method. What does the RMS Statistics Measure? (5)
 (C) What are the elements of Spatial Interpolation? (5)
 (D) Explain Kriging Method in Spatial Interpolation. (5)

Q.7 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) Describe the differences between the Geodatabase Data Model and Coverage Model in the terms of the geometric representation of the spatial features. (5)
 (B) The nearest neighbor method is recommended for resampling Categorical Data. Why? (5)
 (C) Explain why color symbols from a color printer do not exactly match those on the Computer Screen. (5)
 (D) Write short note on Attribute Data Query. (5)
 (E) Explain the differences between the Physical Distance and the Cost Distance. (5)
 (F) Define the Local Methods. Explain the types of Local Methods in Spatial Interpolation. (5)